

13 ROCO<sub>2</sub>, OR, SR, N(R)<sub>2</sub>, OP(R)<sub>2</sub>, and OP(OR)<sub>2</sub>; m is 0 when A is P or B and is 1 when A  
14 is Sn, Si, or C; n is 0 to 4, depending on the number of available sites; and p is 0 to 3 for  
15 the tin stabilizers and 0 to 2 for the boron stabilizers.

Please amend Claim 23 as follows:

23. [Amended] A polymer according to Claim 22 wherein said polymer is polyvinyl  
chloride.

[Please amend Claim 24 as follows:]

24. [Amended] A polymer according to Claim 22 wherein said polymer is a polyester.

#### COMMENTS

As to the election of species, Applicant affirms that a provisional election was made with traverse to prosecute the invention of Group I, species (a), subspecies (i), Claim 6.

The abstract was objected to; it has now been corrected.

Claim 1 was objected to; a comma has been inserted after "polyvinyl acetate."

Claims 1 to 3, 5, 10, 12, and 14 were rejected under 35 U.S.C. §112, first paragraph. The Examiner avers that a person skilled in this art could not make and use all of the stabilizers used in Applicant's invention. Applicant does not agree.

On page 7, lines 2 to 8, of their specification, Applicant described the preparation of some of the stabilizers used in Applicant's invention and cited a reference that describes

their preparation. Applicant encloses herewith a Declaration under 37 C.F.R. §1.132 by the inventor, Dr. Qi Wang. In that Declaration, Dr. Wang explains that the stabilizers used in this invention are either commercially available or can be prepared by techniques described in the literature. No undue experimentation would be needed for a person skilled in this art, such as an organic chemist, to prepare the stabilizers used in Applicant's invention. Dr. Wang also gives citations for the preparation of the various types of stabilizers that are used in Applicant's invention.

Claims 1, 3, 5, 10, 12, and 14 were rejected under 35 U.S.C. §102(a or e) as anticipated by White et al. ("White"). The Examiner refers to column 2, lines 15 to 49, and column 4, lines 4 to 34 of White to show "a process of mixing a polyether with 0.2 to 50 phr of 2-butene-1,4-diol." However, Applicant's claims do not read on 2-butene-1,4-diol. Applicant's Claim 1 states (lines 12 and 13): "... except that when two Y's are O and X is  $-R_1C=CR_1-$  at least one  $R_2$  is not hydrogen; ..." Thus, the first formula given after line 4 of Claim 1 would include 2-butene-1,4-diol only if X was  $-HC=CH-$ , each  $R_1$  was H, each of the two Y's was O, and each  $R_2$  was H. But the above-quoted lines 12 and 13 of Claim 1 state that when two Y's are O and X is  $R_1C=CR_1-$  at least one  $R_2$  must not be hydrogen. Thus, 2-butene-1,4-diol is not included within the scope of Applicant's Claim 1 (or any other of Applicant's claims).

As the Examiner notes, White teach "a process of mixing a polyether." Polyethers are not included within the scope of Applicant's claims.

Claims 1 to 3, 5, 10, 12, and 14 were rejected under 35 U.S.C. §102(b) as

anticipated by GB 1560765 or Havens. The Examiner refers to page 2, lines 45 to 70, page 3, lines 59 to 63, and Example 7 of GB 1560765 as teaching "a process of mixing PVC with 0.01 to 5% by weight of 2-butene-1,4-diol." As explained hereinabove, Applicant's claims, including Claim 1, do not read on 2-butene-1,4-diol. Applicant notes that GB1560765 states (page 2, lines 111 to 118) that a diol is needed to achieve the desired results. It would therefore not be obvious to omit the diol.

The Examiner refers to column 6, lines 7 to 40, Table B, Example 4 [3?] of Havens as teaching "a process of mixing PVC with 0.1% [1.0%?] by weight of 1,4 butene diol." Again, Applicant's claims do not include 1,4-butene diol.

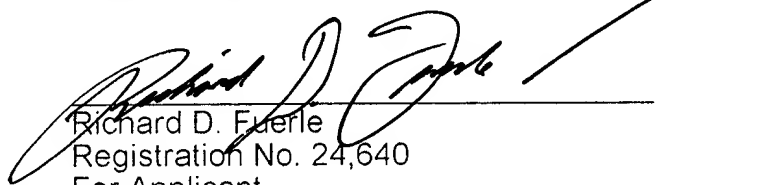
Claims 1 to 3, 5, 10, 12, and 14 were rejected under 35 U.S.C. §102(b) as anticipated by Takayangi et al. ("Takayangi"). The Examiner refers to the Abstract and column 4, lines 19 to 23, as teaching "a thermoplastic resin prepared by blending a polyamide with 0.01 to 5 parts by weight of an acetal such as 7H,4H-1,3-dioxepine." To distinguish over Takayangi, Applicant has deleted "polyamides" from his claims. Takayangi's composition comprises a polyphenylene ether and a polyamide resin. Applicant's claims do not include either polyethers or polyamides. Thus, Takayangi cannot anticipate Applicant's claims. Since polyphenylene ethers and polyamides are not compatible, Takayangi adds the acetal to make them compatible. Thus, it is not obvious to use the Takayangi's acetal with single polymers or with mixtures of polymers that are not incompatible.

Applicant notes that Claims 20 and 21 were found to be allowable over the prior art

of record and that Claim 6 would be allowable if rewritten in independent form. It is Applicant's understanding of the Examiner's rejections that Claims 1 to 3, 5, 10, 12, and 14 were rejected due the Examiner's belief that those claims read on 2-butene-1,4-diol. Since those claims do not include 2-butene-1,4-diol, they should be allowable as well. And, as Claim 1 is a generic claim, the restriction for examination purposes should be withdrawn and the remaining Claims 4, 7 to 9, 11, 13, 15 to 19, and 22 to 24 should be considered and allowed as well.

Reconsideration and allowance of all of the claims are therefore requested.

Respectfully,



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For Applicant

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

The paragraph beginning at line 4 of page 23 has been amended as follows:

[Disclosed is] A polymer of polyvinyl chloride, polyvinylidene chloride, polycarbonate, polyethylene, polypropylene, [polyamide,] polyimide, [polyether,] polyester, or polyvinyl acetate [containing] contains about 0.005 to about 10 phr of a stabilizer to prevent discoloration due to oxidation, particularly gamma radiation.

[Also disclosed is a method of preventing these polymers from discoloring after exposure to oxidation.]

The paragraph beginning at line 8 of page 9 has been amended as follows:

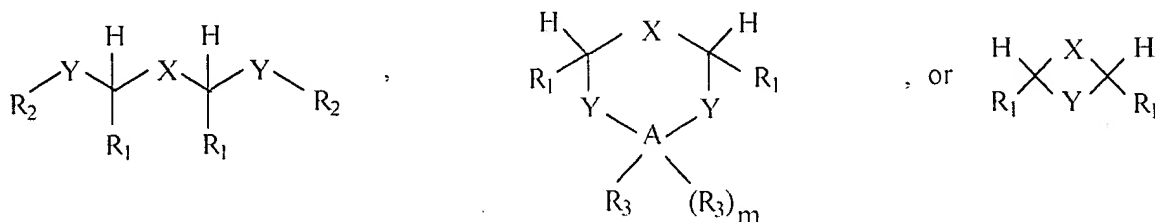
The stabilizers of this invention are effective against oxidation of PVC, polycarbonates, polyurethane, polypropylene, polyethylene, polyvinylidene chloride, [polyamides,] polyimides, [polyethers,] polyesters, polysiloxanes, polyurethanes, polysulfones, and polysulfides. The preferred polymers are PVC, polycarbonates, polypropylene, and polyethylene because those polymers are more frequently used in medical applications where they are subjected to gamma radiation; particularly preferred is PVC.

new  
master

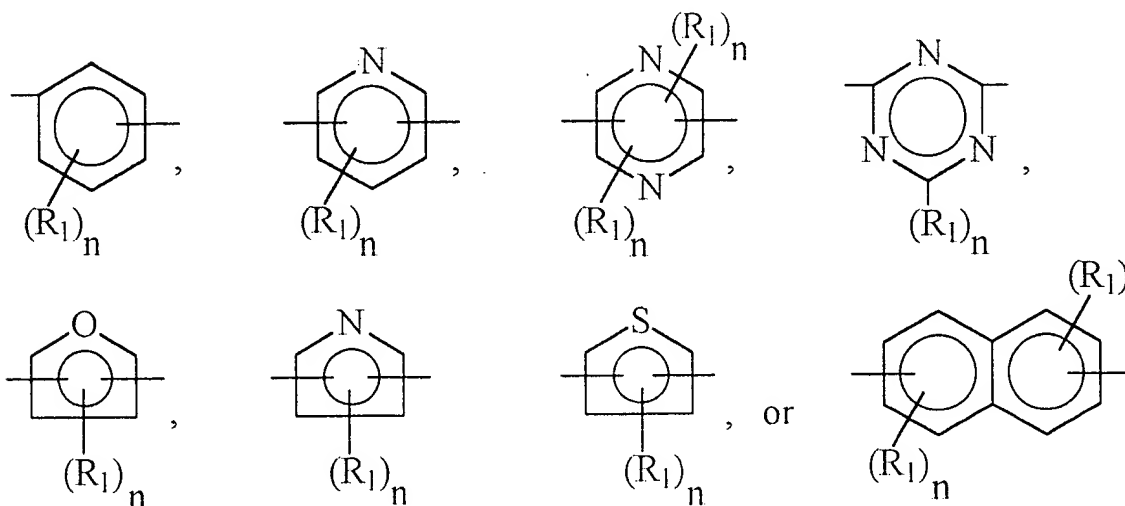
IN THE CLAIMS:

Claim 1 has been amended as follows:

1. [Amended] A polymer which comprises polyvinyl chloride, polyvinylidene chloride, polycarbonate, polyurethane, polyethylene, polypropylene, [polyamide,] polyimide, polyester, or polyvinyl acetate, containing about 0.005 to about 10 phr of a stabilizer having the formula:



where A is C, P, Sn, Si, or B, X is  $-\text{R}_1\text{C}=\text{CR}_1-$ ,  $-\text{C}\equiv\text{C}-$ ,



each Y is independently selected from O and S; each R is independently selected from hydrogen, alkyl from  $\text{C}_1$  to  $\text{C}_{20}$ , aryl from  $\text{C}_6$  to  $\text{C}_{20}$ , alkaryl from  $\text{C}_7$  to  $\text{C}_{20}$ , and aralkyl from

8 C<sub>7</sub> to C<sub>20</sub>; each R<sub>1</sub> is independently selected from R, OR, RCO, ROCO, ROCO<sub>2</sub>, P(R)<sub>2</sub>,  
9 P(OR)<sub>2</sub>, PR(OR), N(R)<sub>2</sub>, (R)<sub>2</sub>NCO, (R)<sub>2</sub>NCO<sub>2</sub>, SR, and halogen; each R<sub>2</sub> is independently  
10 selected from R, RCO, ROCO, P(OR)<sub>2</sub>, Sn(R)<sub>p</sub>(OR)<sub>3-p</sub>, Sn(R)<sub>p</sub>(OCOR)<sub>3-p</sub>, Si(R)<sub>p</sub>(OR)<sub>3-p</sub>,  
11 and B(R)<sub>p</sub>(OR)<sub>2-p</sub>, and two R<sub>1</sub> groups, two R<sub>2</sub> groups, or an R<sub>1</sub> group and an R<sub>2</sub> group can  
12 be bridged together to form a ring, except that when two Y's are O and X is -R<sub>1</sub>C=CR<sub>1</sub>- at  
13 least one R<sub>2</sub> is not hydrogen; each R<sub>3</sub> is independently selected from R, RCO, ROCO,  
14 ROCO<sub>2</sub>, OR, SR, N(R)<sub>2</sub>, OP(R)<sub>2</sub>, and OP(OR)<sub>2</sub>; m is 0 when A is P or B and is 1 when A  
15 is Sn, Si, or C; n is 0 to 4, depending on the number of available sites; and p is 0 to 3 for  
16 the tin stabilizers and 0 to 2 for the boron stabilizers.

Claim 23 has been amended as follows:

23. [Amended] A polymer according to Claim 22 wherein said [stabilizer is a polyether]  
polymer is polyvinyl chloride.

Claim 24 has been amended as follows:

24. [Amended] A polymer according to Claim 22 wherein said [stabilizer] polymer is a  
polyester.

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